

**AMENDMENTS TO THE CLAIMS**

Please amend the claims to read as follows:

1. (currently amended) A sensory apparatus comprising:  
a substrate comprising a plurality of sensors to obtain an analyte profile, the sensors including an ion-selective sensor capable of measuring ion content and a chlorine sensor capable of measuring chlorine content, a pH sensor comprising an ion-selective electrode same or different as said ion-selective sensor, and further comprising a bicarbonate ion sensor which is a differential pCO<sub>2</sub> sensor comprising an unbuffered pH-sensitive electrode sensor and a buffered pH-selective electrode sensor, said buffered pH-selective electrode sensor of said differential pCO<sub>2</sub> sensor being the same or different as the ion selective electrode comprising said pH sensor.
2. (original) The apparatus of claim 1, further comprising an analyzer that corrects the chlorine sensor measurement based on the analyte profile.
3. (original) The apparatus of claim 1, wherein said ion-selective sensor is a calcium ion sensor.
4. (original) The apparatus of claim 1, wherein said ion-selective sensor is a carbonate ion sensor.
5. (original) The apparatus of claim 1, wherein said chlorine sensor is configured to measure free chlorine and total chlorine.
6. (original) The apparatus of claim 1, wherein said chlorine sensor is amperometric.
7. (currently amended) The apparatus of claim 1, comprising a plurality of ion-selective sensors, including a hydrogen ion sensor, a calcium ion sensor, and a carbonate ion sensor, ~~and a bicarbonate ion sensor.~~
8. (original) The apparatus of claim 2, wherein the substrate further comprises one or both of a temperature sensor and a conductivity sensor.

9. (original) The apparatus of claim 8, wherein said analyzer is configured to analyze a signal from one or both of said temperature sensor and said conductivity sensor to independently correct one or more other sensor measurements.

10. (original) The apparatus of claim 1, wherein said substrate further comprises one or more of an ammonia sensor, an oxygen sensor, and an oxidation/reduction potential sensor.

11. (original) The apparatus of claim 1, wherein said substrate comprises a silicon wafer upon which said sensors are formed, said substrate further comprises an external periphery, including a plurality of bond pads on said periphery electrically connected to circuitry inside said periphery.

12. (original) The apparatus of claim 11, wherein said sensors and at least one bond pad are all on the same side of said substrate, and said substrate is physically and electrically connected to a lead frame, said lead frame having a plurality of sides and comprising

an opening through which said sensors are exposed for use;  
at least one exposed conductor area aligned for electrical contact with said bond pad;  
a plurality of electrical terminators, at least one electrical terminator disposed on the same side of said lead frame as said exposed conductor area and electrically connected to said exposed conductor area.

13. (canceled)

14. (canceled)

15. (currently amended) An apparatus for analyzing water quality, comprising: a plurality of ion-selective sensors for measuring ion content of the water, each ion-selective sensor including a sensor element comprising an electrode and an ion-selective membrane on a substrate wherein at least one ion-selective sensor comprises a pH sensor; an amperometric chlorine sensor, the chlorine sensor including a sensor element comprising a working electrode and a counter electrode on said substrate; a bicarbonate ion sensor which is a differential pCO<sub>2</sub> sensor comprising an unbuffered pH-sensitive electrode sensor and a buffered pH-selective electrode sensor, said buffered pH-selective electrode sensor of said

differential pCO<sub>2</sub> sensor being the same or different as the ion selective electrode comprising said pH sensor; and an analyzer unit connected to the sensor elements, wherein the sensor elements transmit signals to the analyzer and wherein the analyzer calculates an analyte profile based on said signals.

16. (currently amended) A sensory apparatus comprising:  
a substrate comprising a plurality of sensors, including  
a free chlorine sensor;  
a pH sensor comprising an ion selective electrode;  
a calcium ion sensor;  
a carbonate ion sensor; and  
a bicarbonate ion sensor which is a differential pCO<sub>2</sub> sensor comprising an unbuffered pH-sensitive electrode sensor and a buffered pH-selective electrode sensor, said buffered pH-selective electrode sensor of said differential pCO<sub>2</sub> sensor being the same or different as the ion selective electrode comprising said pH sensor.

17. (currently amended) The apparatus of claim 16, wherein said free chlorine sensor comprises an amperometric sensor comprising a reference electrode disposed on or off of the substrate; ~~and said pH, calcium ion, and carbonate ion sensors each comprise an ion selective electrode; and said bicarbonate ion sensor is a differential pCO<sub>2</sub> sensor comprising an unbuffered pH-sensitive electrode sensor and a buffered pH-selective electrode sensor, said buffered pH-selective electrode sensor of said differential pCO<sub>2</sub> sensor being the same or different as the ion selective electrode comprising said pH sensor.~~

18. - 23. (canceled)

24. (currently amended) A sensory apparatus, comprising:  
a substrate comprising a plurality of sensors, including:  
a chlorine sensor;  
a pH sensor comprising an ion selective electrode;  
a conductivity sensor;  
a temperature sensor;  
a first ion selective electrode sensor;  
a second ion selective electrode sensor configured to measure a different ion than the first ion selective electrode sensor;

a bicarbonate ion sensor which is a differential pCO<sub>2</sub> sensor comprising an unbuffered pH-sensitive electrode sensor and a buffered pH-selective electrode sensor, said buffered pH-selective electrode sensor of said differential pCO<sub>2</sub> sensor being the same or different as the ion selective electrode comprising said pH sensor; and

an analyzer,

wherein the analyzer is configured to correct a measurement of the first ion selective electrode sensor based upon the measured conductivity and temperature, and

wherein the analyzer is configured to correct a measurement of the chlorine sensor based upon the measured pH.

**25.** (previously presented) The apparatus of claim 24, wherein the analyzer is configured to correct a measurement of the second ion selective electrode sensor based upon the measured conductivity and temperature.

**26.** (previously presented) The apparatus of claim 25, wherein the analyzer is configured to correct a measurement of the pH sensor based upon measurements of the first and second ion selective electrode sensors and based upon the measured temperature.